

What is Claimed Is:

- 1 1. A method of improving uniformity of plasma etching, comprising the
2 steps of:
3 etching a wafer with a free radical plasma;
4 exposing said wafer to infrared energy from an infrared energy source;
5 and
6 attenuating said infrared energy in a predetermined pattern to reduce non-
7 uniformities.
- 1 2. The method of claim 1, wherein said infrared energy comprises resonant
2 infrared energy.
- 1 3. The method of claim 2, wherein said step of attenuating said infrared
2 energy in a predetermined pattern to reduce non-uniformities comprises positioning a
3 filter having a predetermined pattern of variable transmittance regions between said
4 infrared energy source and said wafer.
- 1 4. The method of claim 3, wherein said predetermined pattern of said filter
2 comprises an outer perimeter having a first transmittance and a center portion having a
3 second transmittance.
- 1 5. The method of claim 4, wherein said first transmittance is lower than said
2 second transmittance.

1 6. The method of claim 3, wherein said predetermined pattern of said filter
2 comprises a series of eccentric regions of gradually decreased transmittance.

1 7. The method of claim 3, wherein said predetermined pattern of said filter
2 comprises a first region having a first transmittance and a plurality of second regions
3 having a second transmittance.

1 8. The method of claim 1, further comprising the step of filtering said
2 infrared energy to have a resonant frequency.

1 9. The method of claim 8, wherein the steps of filtering said infrared energy
2 to have a resonant frequency and attenuating said infrared energy in a predetermined
3 pattern to reduce non-uniformities comprise positioning a filter between said infrared
4 energy source and said wafer.

1 10. The method of claim 8, wherein the steps of filtering said infrared energy
2 to have a resonant frequency and attenuating said infrared energy in a predetermined
3 pattern to reduce non-uniformities are performed by a single filter.

1 11. A filter for reducing non-uniformities in a plasma etching process,
2 comprising:

3 a first region having a first transmittance; and

4 a second region having second transmittance that is different than said
5 first transmittance level.

- 1 12. The filter of claim 11, wherein said first region comprises a perimeter of
2 said filter and said second region comprises a center portion of said filter.
- 1 13. The filter of claim 12, wherein said first transmittance is lower than said
2 second transmittance.
- 1 14. The filter of claim 11, wherein said first region and said second region are
2 eccentric.
- 1 15. The filter of claim 11, wherein said second region is positioned to reduce
2 transmission in areas where said plasma etching process experiences magnetic field
3 cusping.
- 1 16. The filter of claim 11, wherein said filter comprises optical quality glass
2 having a layer of metallic coating of a predetermined thickness.
- 1 17. The filter of claim 11, wherein the thickness of said layer of metallic
2 coating varies to form said first and said second regions.